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DISTRIBUTION OF THE MARINE SHELLS OF FLORIDA.*

BY DR. WILLIAM STIMPSON.

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ONE of the most striking peculiarities of the zoology of Florida is the diversity in the character of the littoral shells of the two sides of the peninsula. The naturalist passing from St. Augustine to Cedar Keys finds upon the western beach a group of shells so different from those he had seen upon the Atlantic shore, that he is reminded of the similar (though vastly greater) difference in the fauna which exists on the two sides of the continent itself; for instance, at the isthmus of Panama. This diversity is seen in the common large shells as well as in the fauna taken as a whole. Thus on the east coast *Busycon canaliculatum*, *B. carica*, *Dosinia discus*, *Arca incongrua* and *A. Americana* are the most abundant shells, while they are not found at all on the west coast; and at Cedar Keys and Tampa Bay we find the sub-tropical species *Cassidulus corona*, *Busycon perversum*, *Pyrrula papyratia*, *Strombus alatus*, *Bulla occidentalis*, *Callista gigantea*, *Dosinia elegans* and *Arca Floridana*? strewed on the beaches in great numbers, while they occur but rarely on the east coast; some of them not at all. The list presented contains the names of three hundred and fourteen species collected by me on the two coasts, of which only one hundred and forty-five, or less than half, were common to both; fifty-eight being peculiar to the east and one hundred and eleven to the west coast. Several of these species are indeed representative, but specifically quite distinct. These results will no doubt be considerably modified by future researches, as some of the smaller species may have escaped detection on one or the other of the two shores, although really existing upon both. But the fact will, nevertheless, remain that a marked difference exists between the faunæ of these shores notwithstanding their proximity and notwith-

* Abstract of a paper read at a recent meeting of the Chicago Academy of Sciences.

standing the comparatively recent origin of the peninsula which separates them.

Of the recent origin of the Floridan peninsula (or at least of the northern part which makes the separation between the great Carolinian Bay and the Gulf of Mexico), we have not only geological but zoölogical evidence. Although, as shown above, the littoral fauna* of that part of the gulf which bathes the west coast of Florida is of a character far more tropical than that of the east coast, the fauna of the latter is reproduced in the northwestern part of the gulf. The correspondence between the shells of Galveston and those of South Carolina was noticed by Roemer many years ago, and the fact is now confirmed by an examination of the shells brought by Dr. Durham from several points on the coast between Point Isabel and Pensacola. The peninsula and warm waters of the southern cape of Florida now form an impassable barrier to the western migration of species of the temperate fauna into the colder parts of the gulf, but of their connection within a comparatively recent geological period there can be no doubt. The connection was probably through sandy straits and lagoons, too shallow to allow of the passage of the gulf-stream, but perhaps permitting the westward flow of the cold waters of the Carolinian Bay.

The present tropical character of the shells of the west coast of Florida is plainly due to the influence of the gulf-stream, which is not here, as in the northwestern part of the gulf, crowded off the shores by the waters of a great river, or by cold northwest winds. On the other hand the east coast, as far south as Cape Canaveral, forms a part of the shore of the Carolinian Bay, along which, inside of the gulf-stream, a cold current runs, giving to this part of Florida a coast fauna similar to that of South Carolina.

* By the *littoral* fauna, that of the true ocean shores is here meant. The waters of the shallow inlets and estuaries of the west coast are subject to great changes of temperature, which, during the winter "northers," may fall to the freezing point, at which times fish caught in such places die in great numbers. As might be expected, the fauna of these inlets is very different from that of the beaches, and such northern forms as *Modiola plicatula* and *Cardium Mortoni*, which are adapted to such extremes of temperature, find here a congenial station.